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R. Casse: Projective Geometry – An Introduction*, Oxford University Press, Oxford, 2006, 198 pp., GBP 24,95, ISBN 0-19-929886-6*

This textbook is a very accessible introduction to projective geometry based on lectures given at the University of Adelaide. The book assumes a familiarity with linear algebra, elementary group theory, partial derivatives, finite fields and elementary coordinate geometry, hence it is suitable for students in their third or fourth year at university. The beginning of the book is devoted to Desargues' theorem, which plays a key role in projective geometry. In the following chapters, the author introduces the reader to axiomatic geometry and defines the field plane $PG(2,F)$ and its higher dimensional generalization $PG(r,F)$. The author also considers projective spaces of dimension 2 (known as non-Desarguesian planes). The last chapters deal with conics and quadrics in $PG(3,F)$. The textbook uses modern concepts of projective geometry closely related to algebra and algebraic geometry with the aim of helping the reader to understand and master proof techniques. An attractive feature of the book is a number of solved examples and more than 150 exercises. (jol)

P. J. Collins: Differential and Integral Equations*, Oxford University Press, Oxford, 2006, 372 pp., GBP 27,50, ISBN 0-19-929789-4; GBP 70, ISBN 0-19-853382-9*

This book serves as a guide to undergraduate courses in ordinary and partial differential equations. It contains the basic theory of ordinary differential equations (existence and uniqueness theorems), the variation of parameters method and the correspondence between differential and integral equations. Concerning partial differential equations, the book introduces the reader to first and second order partial differential equations, the reduction of the more general elliptic, parabolic and hyperbolic equations to the Laplace equation, the heat equation and the wave equation, together with classical results on these three basic equations. Some additional methods are then presented (including the Neumann series expansion for integral equations, the power series method, the Fourier transform method and the phase-plane analysis). There is also an introduction to the calculus of variations. The book is very well arranged. Every section is followed by many examples and exercises for better understanding of the topic. Theorems are usually not formulated in the strongest possible form, which increases the comprehensibility of the text. The book is intended not only for students of mathematics but also for students of physics, economics and other fields where differential equations play an important role. (bar)

J. Dauns, Y. Zhou: Classes of Modules*, Pure and Applied Mathematics, vol. 281, Chapman & Hall/CRC, Boca Raton, 2006, 218 pp., USD 89,95, ISBN 1-58488-660-9*

General module theory is too vast an area to provide for general structure theory, the major problem being the lack of a satisfactory decomposition theory. In this monograph, the authors propose the notions of a natural class of modules (i.e. a class closed under submodules, direct sums and essential extensions) and of a type submodule (i.e. a submodule maximal among those belonging to a natural class) to overcome this problem. They call a module M a TS-module if every type submodule of M is a direct summand. TS-modules thus generalize the notions of an extending module or a CS-module. In chapter 4, type dimension theory of a module is developed in analogy to the classical finite uniform dimension theory. Chapter 5 extends decomposition theory of CS-modules to TS-modules. It contains moreover a far reaching generalization of the Goodearl-Boyle decomposition theory of non-singular injective modules into type I, II, and III submodules (using the fact that in the appropriate generalization, type I, II, and III modules form a natural class each). Chapter 6 deals with relations between the structure of a ring R and the lattice of (pre-)natural classes of R-modules. As the authors point out, the book not only presents a new theory but it suggests a new path through general ring and module theory. (jtrf)

E. Deza, M. M. Deza: Dictionary of Distances*, Elsevier, Amsterdam, 2006, 391 pp., EUR 125, ISBN 0-444-52087-2*

This book covers in an encyclopedic way many aspects of the broad concept of 'distance'. It is divided into seven parts and 28 chapters, the majority of the text dealing with a rich variety of metrics on an equally rich class of mathematical objects. Some space is devoted to entries from outside of mathematics, including concepts as foreign to quantification as for example 'moral distance' or curiosities like 'Ironman distance' or Hollywood 'co-starring distance' (the last one to be found in chapter 22, which is called "Distances in Internet and Similar Networks"). The title correctly announces that the book is written as a dictionary, that is, the reader is given a list of entries, each of them treated in a short and succinct way. The collection originates from a personal archive of the authors. The majority of the book is written for a reader who is familiar with technical mathematical language. At the end of the book is a list of entries but there is no index of keywords (that means for example that you will not find the Euler angle metric if looking for the keyword 'angle'; it is listed only under the letter 'E'). Anybody who wants a comprehensive and reliable list of different mathematical (and some non-mathematical) concepts of distance in one place (and without using Google) will find it in this book. (shol)

F. J. E. Dillen, L. C. A. Verstraelen, Eds.: Handbook of Differential Geometry II*, Elsevier, Amsterdam, 2006, 560 pp., EUR 175, ISBN 0-444-52052-X*

This book is the second volume of a two-volume handbook reviewing many topics of contemporary differential geometry. In this volume there are eight surveys on various themes: Finsler geometry and its differential invariants (written by J. Alvarez Paiva), foliations, characteristic classes and deformation theory (by R. Barre and A. Kacimi Alaoui), symplectic manifolds, Lagrangian submanifolds and complex structures, Hamiltonian geometry and symplectic reduction (by A. Cannas da Silva), metric Riemannian geometry including Gromov-Hausdorff distance, collapsing Riemannian manifolds, Alexandrov spaces and Hausdorff convergence (by K. Fukaya), contact manifolds, particularly in dimension 3 (by H. Geiges), complex manifolds, Kahler manifolds and harmonic differential forms (by I. Mihai), Lagrange spaces, Finsler spaces and Lagrange spaces of higher order (by R. Miron), and Lorentzian manifolds and their curvature, geodesics and the Bochner techniques (by F. Palomo and A. Romero). The volume therefore covers many important fields in differential geometry. (vs)